Current Status of All Claims in Application/

Amendments

1 (canceled).

2 (canceled).

3 (canceled).

4 (canceled).

5 (canceled).

6 (canceled).

7 (canceled).

8 (previously presented). The method of Claim 35, wherein said solid substrate surface comprises a group selected from oxides, nitrates, metals, semiconductors, polymers with a functional group, and mixtures thereof.

9 (previously presented). The method of Claim 35 further comprising contacting said solid surface with the silylating agent prior to said step (a).

10 (original). The method of Claim 9, wherein said solid substrate surface comprises a hydroxide.

11 (canceled).

12 (canceled).

13 (previously presented). The method of Claim 35, wherein said metal halide is tungsten fluoride.

14 (previously presented). The method of Claim 35, wherein the silylating agent comprises silane, disilane, trisilane and mixtures thereof.

15 (previously presented). The method of Claim 35, wherein said thin metal film surface comprises metal-metal halide surface.

16 (previously presented). The method of Claim 35 further comprising repeating said steps (b) and (c) to obtain a desired thickness of said metal film.

17 (canceled).

18 (canceled).

19 (canceled).

20 (previously presented). The method of claim 36, wherein said thin metal film surface comprises metal-metal halide surface.

21 (previously presented). The method of Claim 36 further comprising repeating said steps (b) and (c) to obtain a desired thickness of said metal film.

22 (previously presented). The method of Claim 36, wherein said solid substrate surface comprises a group selected from oxides, nitrates, metals, semiconductors, polymers with a functional group, and mixtures thereof.

23 (previously presented). The method of Claim 36 further comprising contacting said solid substrate surface with the silylating agent prior to said step (a).

24 (original). The method of Claim 23, wherein said solid substrate surface comprises a hydroxide.

25 (withdrawn). A solid material comprising a solid substrate having a thin metal film layer, wherein the ratio of roughness of the solid substrate surface to the roughness of the solid material surface is from about 0.8 to about 1.2.

26 (withdrawn). The solid material of Claim 25, wherein the roughness of a flat portion of said solid material is about 50% or less of roughness of a substantially same solid material produced by a chemical vapor deposition process.

27 (withdrawn). The solid material of Claim 25, wherein the thickness of said metal film layer is about 100 Å or less.

28 (withdrawn). The solid material of Claim 25, wherein said metal is tungsten.

29 (withdrawn). The solid material of Claim 28, wherein the thickness of said metal film layer is substantially (2.5 Å x n), wherein n is an integer.

30 (withdrawn). The solid material of Claim 25, wherein said solid substrate comprises a conducting, insulating or a semiconductor material.

31. (withdrawn). A solid material comprising a solid substrate having a thin metal film layer, wherein the roughness of a flat portion of said solid material is about 50% or less of roughness of a substantially same solid material produced by a chemical vapor deposition process.

32. (withdrawn). The solid material of Claim 31, wherein the ratio of roughness of the solid substrate surface to the roughness of the solid material surface is from about 0.8 to about 1.2.

33. (withdrawn). The solid material of Claim 31, wherein said metal is tungsten.

34. (withdrawn). The solid material of Claim 33, wherein said solid substrate comprises a conducting, insulating or a semiconductor material.

35 (previously presented). A method for producing a solid material comprising a thin film of metal on a solid substrate surface, said method comprising:

(a) contacting said solid substrate surface with a metal halide gas, wherein the metal is selected from the group consisting of tungsten, rhenium, molybdenum, antimony, selenium, thallium, chromium, platinum, ruthenium, iridium, and germanium, under conditions including a temperature from 425 to 600 K sufficient to deposit a layer of said metal halide on said solid substrate surface;

(b) thereafter contacting said surface with a reducing agent consisting of a gaseous silylating agent under conditions including a temperature from 425 to 600 K, such that the silylating agent reacts with metal halide species on said solid substrate surface to form silane moieties at the surface of the substrate;

(c) then contacting said surface with additional metal halide gas under conditions including a temperature from 425 to 600 K such that the additional metal halide gas reacts with the silane moieties formed at the surface of the substrate in step (b) to form a metal film layer having metal halide surface species;

and thereafter sequentially repeating steps (b) and (c) one or more additional times, whereby in each cycle of steps (b) and (c), the metal halide and silylating agent react to produce a metal film layer having a thickness substantially corresponding to the atomic spacing of said metal.

36 (previously presented). A method for producing a solid material comprising a thin film of metal on a solid substrate surface, said method comprising:

(a) contacting said solid substrate surface with a metal fluoride gas, wherein the metal is selected from the group consisting of tungsten, rhenium, molybdenum, antimony, selenium, thallium, chromium, platinum, ruthenium, iridium, and germanium, under conditions including a temperature from 425 to 600 K sufficient to deposit a layer of said metal fluoride on said solid substrate surface;

(b) thereafter contacting said surface with a reducing agent consisting of a gaseous silylating agent under conditions including a temperature from 425 to 600 K, such that the silylating agent reacts with metal fluoride species on said solid substrate surface to form silane moieties at the surface of the solid substrate;

(c) then contacting said surface with additional metal fluoride gas under conditions including a temperature from 425 to 600 K such that the additional metal fluoride gas

reacts with the silane moieties formed at the surface of the substrate in step (b) to form a metal layer having metal fluoride surface species;

and thereafter sequentially repeating steps (b) and (c) one or more additional times, whereby in each cycle of steps (b) and (c), the metal fluoride and silylating agent react to produce a metal film layer having a thickness substantially corresponding to the atomic spacing of said metal.

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